

Laborator si seminar

# Programare in Java si software matematic

Adrian Ichimescu

[Adrianichimescu@gmail.com](mailto:Adrianichimescu@gmail.com)

# *Control flow statements*

- decision-making statements
  - if-then
  - if-then-else
  - switch
- looping statements
  - for
  - while
  - do-while
- branching statements
  - break
  - continue
  - return

# Exercise1

```
class IfElseDemo {  
    public static void main(String[] args) {  
        int testscore = 76;  
        char grade;  
        if (testscore >= 90) {  
            grade = 'A';  
        } else if (testscore >= 80) {  
            grade = 'B';  
        } else if (testscore >= 70) {  
            grade = 'C';  
        } else if (testscore >= 60) {  
            grade = 'D';  
        } else {  
            grade = 'F';  
        }  
        System.out.println("Grade = " + grade);  
    }  
}
```

# Exercise2

```
public static void main(String[] args) {  
  
    int month = 3;  
  
    String monthString;  
  
    switch (month) {  
  
        case 1: monthString = "January"; break;  
  
        case 2: monthString = "February"; break;  
  
        case 3: monthString = "March"; break;  
  
        case 4: monthString = "April"; break;  
  
        case 5: monthString = "May"; break;  
  
        case 6: monthString = "June"; break;  
  
        case 7: monthString = "July"; break;  
  
        case 8: monthString = "August"; break;  
  
        case 9: monthString = "September"; break;  
  
        case 10: monthString = "October"; break;  
  
        case 11: monthString = "November"; break;  
  
        case 12: monthString = "December"; break;  
  
        default: monthString = "Invalid month"; break;  
  
    }  
  
    System.out.println(monthString);  
  
}
```

## Exercise3

Please display the name of the month using if-then-else statements

## Exercise4

```
package lab3;

public class WhileDemo {
    public static void main(String[] args){
        int count = 1;
        while (count < 11) {
            System.out.println("Count is: " + count);
            count++;
        }
    }
}
```

## Exercise5

Use do-while and then for statements to implement similar application as in Exercise4. How would you do it using array?

# Exercise 6

```
package lab3;

public class BreakDemo {

    public static void main(String[] args) {

        int[] arrayOfInts = {32,87,3,589,12,1076,2000,8,622,127};

        int searchfor = 87;

        int i;

        boolean foundIt = false;

        for (i = 0; i < arrayOfInts.length; i++) {

            if (arrayOfInts[i] == searchfor) {

                foundIt = true;

                break;

            }

        }

        if (foundIt) {

            System.out.println("Found " + searchfor + " at index " + i);

        } else {

            System.out.println(searchfor + " not in the array");

        }

    }

}
```



# Exercise 7

## Use of all flow statements

```
package lab3;

import java.util.Arrays;

public class ArraySort {

    public static void main (String[] args) {

        int[] array = {1,4,6,2,7,3};

        int i = 0;

        boolean swapped = true;

        int j = 0;
        int tmp;
        while (swapped) {
            swapped = false;
            j++; //algoritm de sortare prin interschimbare
            for (i = 0; i < array.length - j; i++) {
                if (array[i] > array[i + 1]) {
                    tmp = array[i];
                    array[i] = array[i + 1];
                    array[i + 1] = tmp;
                    swapped = true;
                }
            }
        }

        // Arrays.sort(array); //second way of array sorting using sort method offered by Array package
        for (i=0;i<array.length;i++) System.out.print(String.valueOf(array[i])+ ' ');

    }
}
```

# Exercise 7

## step by step

### Bubble Sort

- 1 4 6 2 7 3
- $i=0$
- $j=0$
- Step1
- $i=0..5$
- $i=0, j=1$  false
- $i=1, j=1$  false
- $i=2, j=1$  true 1 4 2 6 7 3
- $i=3, j=1$  true
- $i=4, j=1$  true 1 4 2 6 3 7
- Step2
- $i=0..4$
- $i=0, j=2$  false
- $i=1, j=2$  true 1 2 4 6 3 7
- $i=2, j=2$  true
- $i=3, j=2$  true 1 2 4 3 6 7
- Step3
- $i=0..3$
- $i=0, j=3$  false
- $i=1, j=3$  false
- $i=2, j=3$  true 1 2 3 4 6 7
- Step4
- $i=0..2$
- $i=0, j=4$  false
- $i=1, j=4$  false
- Out of while structure
- print 1 2 3 4 6 7

## Exercise8

How should ArraySort class from previous example be modified to sort in descending way the array components?